

App. Serial No. 10/530,063
Docket No.: BE 020027 US

Remarks

Claims 1-8 and 17-20 are currently pending in the patent application. For the reasons and arguments set forth below, Applicant respectfully submits that the claimed invention is allowable over the cited references.

The non-final Office Action dated March 22, 2006 indicated an objection to the specification, an objection to claims 7 and 17-20, and listed the following rejections: claims 1-3, 6-7, 17 and 20 stand rejected under 35 U.S.C. § 102(b) over Kong *et al.* (U.S. 5,119,540); claims 4-5 and 18-19 stand rejected under 35 U.S.C. § 103(a) over Kong *et al.* in view of Kacppeler *et al.* (WO 01/14619); and claim 8 stands rejected over Kong *et al.* as applied to claims 1-3, 6-7, 17 and 20 above, and in further view of examiner comments.

Applicant respectfully traverses the Objection to the Specification because the indicated suggestions in 37 C.F.R. § 1.77(b) are not statutorily required for filing a non-provisional patent application under 35 USC § 111(a), but per 37 C.F.R. § 1.51(d) are only guidelines that are suggested for applicant's use. They are not mandatory, and in fact when Rule 77 was amended in 1996 (61 FR 42790, Aug. 19, 1996), Bruce A. Lehman, Assistant Secretary of Commerce and Commissioner of Patents and Trademarks, stated in the Official Gazette:

"Section 1.77 is permissive rather than mandatory. ... 1.77 merely expresses the Office's preference for the arrangement of the application elements. The Office may advise an applicant that the application does not comply with the format set forth in 1.77, and suggest this format for the applicant's consideration; however, the Office will not require any application to comply with the format set forth in 1.77."

In view of the above, Applicant prefers not to add section headings, and requests that the objection to the specification be removed.

Applicant respectfully traverses the claim objections because the term "low" as objected to would be understood by one of ordinary skill in the art; the specification discusses various example embodiments directed to subject matter that may be characterized by the term, and in certain instances, describes specific functionality and temperatures related thereto. For example, paragraphs 0028, 0035 and 0037 describe example embodiments directed to such applications. Notwithstanding the above, the

App. Serial No. 10/530,063
Docket No.: BE 020027 US

term objected to is no longer present in the amended claims. In this regard, Applicant requests that the objections be removed.

Applicant respectfully traverses the Section 102(b) rejections of claims 1-3, 6, 7, 17 and 20 because the Kong reference fails to correspond to, and further teaches away from, all of the claimed limitations. Regarding independent claim 1 (and as relevant to the claims that depend therefrom), the Office Action fails to cite any portion of the Kong reference that corresponds to claimed limitations directed to employing nitrogen or a noble gas as a carrier gas in a chemical vapor deposition (CVD) process or otherwise. For example, the cited portions of the Kong reference use hydrogen as a carrier gas, with nitrogen used as a donor dopant source (and not used as a carrier gas). *See, e.g.,* (col. 5, lines 60-68). Moreover, the Kong reference teaches away from using nitrogen as a carrier gas, in that the primary purpose of the Kong reference is to provide a CVD growth process for silicon carbide which minimizes or eliminates nitrogen contamination in the resulting epitaxial layers of silicon carbide. *See, e.g.,* (col. 3, lines 25-50). The source of the nitrogen contamination is the presence of nitrogen in the source and carrier gases used during CVD. *See, e.g.,* (col. 1, lines 50-57).

In regard to dependent claims 2, 3, 6, 7, 17 and 20, which depend from claim 1, Applicant requests that the Section 102(b) rejections be withdrawn because they are improper for the reasons discussed above. Moreover, the portions of the Kong reference cited in connection with the rejection of certain dependent claims also fail to correspond to the limitations found therein. For example, regarding claims 7, 17 and 20, the Office Action fails to cite any portion of the Kong reference that corresponds to claimed limitations directed to low temperature CVD in the context of the claimed invention. The Kong reference teaches that CVD of silicon carbide takes place at temperatures greater than 1400°C, and preferably at temperatures in the range of 1500°C to 1800°C. *See, e.g.,* (col. 5, lines 16-25). However, as is known in the art and as further described in the specification of the instant invention, temperatures in the range of 1100°C to 1400°C are generally referred to as ultra high temperatures. *See, e.g.,* (paragraph 0011).

In view of the above, the Section 102(b) rejections in the Office Action fail to cite portions of the Kong reference that correspond to the claimed limitations. In this regard,

App. Serial No. 10/530,063
Docket No.: BE 020027 US

the Section 102(b) rejections of claims 1-3, 6, 7, 17 and 20 are improper and should be removed.

Applicant traverses the section 103(a) rejections of claims 4, 5, 18 and 19 over Kong in view of Kaeppeler because the cited portions of the Kong references do not correspond to the claimed limitations as discussed above in connection with claim 1. In this regard, the rejections of claims 4, 5, 18 and 19 are improper because these claims depend from claim 1, and the corresponding rejections rely upon the same (improper) rationale. Applicant further traverses the section 103(a) rejections because the proposed combination of references fails to teach or suggest the limitations as asserted in the Office Action. For example, the Office Action fails to cite a portion of the Kaeppeler reference that teaches carrying out CVD at a low temperature. The Kacppeler reference teaches a CVD process that is carried out at a high temperature of approximately 1100°C to 1800°C. *See, e.g., (Abstract).* As understood in the art, and as discussed in the background of the instant application and described above, CVD temperatures of between about 1100°C to 1400°C are generally referred to as ultra high temperatures. In this regard, the combination of references fails to teach or suggest this limitation for the same reasons discussed above relating to the Section 102(b) rejections of claims 7, 17 and 20. Accordingly, the Section 103(a) rejections of claims 4, 5, 18 and 19 are improper and Applicant requests that they be withdrawn.

Applicant also traverses the section 103(a) rejection of claim 8 because the Office Action's suggestion that carrying out CVD at the claimed temperature of less than about 600°C would have been obvious and was led to via "routine experimentation" is improper and contrary to relevant law and the M.P.E.P. For example, M.P.E.P. § 2141.02 indicates that discovering the source or cause of a problem is part of the "as a whole" inquiry. "[A] patentable invention may lie in the discovery of the source of a problem even though the remedy may be obvious once the source of the problem is identified." *In re Sponnoble*, 405 F.2d 578, 585, 160 USPQ 237, 243 (CCPA 1969). In this instance, the Kong reference teaches that CVD of silicon carbide takes place at temperatures greater than 1400°C, and preferably at temperatures in the range of 1500°C to 1800°C. *See, e.g., (col. 5, lines 16-25).* In connection with the instant application and as described in the specification, Applicant has discovered that performing CVD at a low

App. Serial No. 10/530,063
Docket No.: BE 020027 US

temperature increases the growth rate of the epitaxial layer, and that low temperature CVD is facilitated by the use of nitrogen as a carrier gas. *See, e.g.*, (paragraphs 0028 and 0035). Moreover, as discussed above, the Kong reference teaches away from using nitrogen as a carrier gas for the reasons discussed above relating to the Section 102(b) rejection of claim 1. Therefore, an artisan skilled in the subject matter of the Kong reference would not be led to experiment with such a drastically lower temperature, and would further be discouraged from using nitrogen as a carrier gas. Accordingly, the Section 103(a) rejection of claim 8 is improper and Applicant requests that it be withdrawn.

Notwithstanding the above, certain claims have been amended in a manner not inconsistent with the claims as filed, and consistent with the specification. For example, each of claims 17-20 has been amended, with the objected-to term "low" removed and replaced with language that is consistent with the removed term and with the specification. Applicant notes that this change is not being made for any patentability reasons relative to any cited prior art, in that the rejections fail for the reasons discussed above. Support for these amendments can be found, for example, in the specification at paragraphs 0028 and 0035. The claims as amended are also allowable over the cited references because the references do not teach or suggest limitations directed to, for example, CVD at a temperature of less than about 1100°C (to which various example embodiments may be directed), and more particularly to CVD at a temperature of less than about 600°C. Accordingly, the Section 102(b) and Section 103(a) rejections of the claims are improper and Applicant requests that they be withdrawn.

App. Serial No. 10/530,063
Docket No.: BE 020027 US

In view of the remarks above, Applicant believes that each of the rejections has been overcome and the application is in condition for allowance. Should there be any remaining issues that could be readily addressed over the telephone, the Examiner is asked to contact the agent overseeing the application file, Peter Zawilski, of Philips Corporation at (408) 474-9063.

Please direct all correspondence to:

Corporate Patent Counsel
Philips Intellectual Property & Standards
1109 McKay Drive; Mail Stop SJ41
San Jose, CA 95131

By: _____
Name: Robert J. Crawford
Reg. No.: 32,122
(VLSI.479PA)

CUSTOMER NO. 24738